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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/511,047

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EXAMINER

LAU, JONATHAN S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/511,047	Applicant(s) RAVANKO ET AL.	
	Examiner Jonathan S. Lau	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 16 Dec 2008 has been entered.

This Office Action is responsive to Applicant's Amendment and Remarks, filed 16 Dec 2008, in which claims 1, 5, 6, 8-16, 18, 19 and 22-25 are canceled and new claims 26-38 are added.

This application is the national stage entry of PCT/ EP03/01091, filed 04 Feb 2003; and claims benefit of foreign priority document FINLAND 20020675, filed 09 Apr 2002; the certified copy of this foreign priority document is in English.

Claims 26-38 are pending.

Rejections Withdrawn

Applicant's Amendment, filed 16 Dec 2008, with respect to claims 1, 5, 6, 8-10, 13-15, 18, 19, 22 and 23 rejected under 35 U.S.C. 103(a) as being unpatentable over

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Heikkila et al. (US Patent 6,572,775, of record) as evidenced by Scott et al. (US Patent 5,348,871, issued 20 Sep 1994, of record) in view of Catani et al. (US Patent 5,988,177, issued 07 Dec 1999, of record) and in view of Masuda et al. (US Patent 5,391,299, of record) has been fully considered and is persuasive, as claims 1, 5, 6, 8-10, 13-15, 18, 19, 22 and 23 are canceled.

This rejection has been **withdrawn**.

Applicant's Amendment, filed 16 Dec 2008, with respect to claims 1 and 10-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Heikkila et al. (US Patent 6,572,775, of record) as evidenced by Scott et al. (US Patent 5,348,871, issued 20 Sep 1994, of record) in view of Catani et al. (US Patent 5,988,177, issued 07 Dec 1999, of record) and in view of Masuda et al. (US Patent 5,391,299, of record) as applied to claims 1, 5, 6, 8-10, 13-15, 18, 19, 22 and 23 above, and further in view of Liaw et al. (US Patent 6,129,788, issued 10 Oct 2000, of record) has been fully considered and is persuasive, as claims 1 and 10-12 are canceled.

This rejection has been **withdrawn**.

Applicant's Amendment, filed 16 Dec 2008, with respect to claims 1, 15, 16, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heikkila et al. (US Patent 6,572,775, of record) as evidenced by Scott et al. (US Patent 5,348,871, issued 20 Sep 1994, of record) in view of Catani et al. (US Patent 5,988,177, issued 07 Dec 1999, of record) and in view of Masuda et al. (US Patent 5,391,299, of record) as

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applied to claims 1, 5, 6, 8-10, 13-15, 18, 19, 22 and 23 above, and further in view of Antrim et al. (US Patent 6,436,678, issued 20 Aug 2002, of record) has been fully considered and is persuasive, as claims 1, 15, 16, 24 and 25 are canceled.

This rejection has been **withdrawn**.

Specification

The disclosure is objected to because of the following informalities: at page 11, line 9 of paragraph 4, the term "Amberlite C 3120" appears. It is unclear if this is a typographical error for "Amberlite CG-120", as Amberlite CG-120 is a known product, see US Patent 4,487,198 (provided by Applicant in IDS mailed 31 Jan 2005) at column 2, line 55, and a product corresponding to "Amberlite C 3120" could not be located.

Appropriate correction or a statement regarding the correctness of the specification is required.

The following are new grounds of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

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the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 26-29 and 31-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Devos et al. (US Patent 4,849,023, issued 18 Jul 1989, cited in PTO-892) in view of Miyake et al. (US Patent 4,487,198, issued 11 Dec 1984, provided by Applicant in IDS mailed 31 Jan 2005). Definition of DOWEX resins is provided by Dow (Fine Mesh Resins, Dow Water Solutions, accessed online on 25 Feb 2009, cited in PTO-892)

Devos et al. teaches the process for the preparation of a product with a high content of maltitol comprising catalytic hydrogenation of a maltose syrup and adjustment to the desired dry matter of the fraction enriched in maltitol (abstract). Devos et al. teaches a feed solution having a maltose content of 50 to 80% on dry matter produced by treatment of the maltose feed solution with enzymes (column 4, lines 5-15). Devos et al. teaches the embodiment wherein a maltose rich syrup is produced comprising 1.8% dextrose, 74.9% maltose and 15.9% maltotriose by weight (column 6, lines 40-50) and the embodiment wherein a maltose rich syrup is produced comprising 2.3% dextrose, 61.3% maltose and 7.5% trisaccharides by weight (column

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11, lines 1-10). Devos et al. teaches the embodiment wherein the hydrogenated mannitol-containing syrup is crystallized from the mixture (column 12, lines 40-65).

Devos et al. teaches the embodiment wherein the hydrogenated mannitol-containing syrup is further treated by chromatographic separation (column 7, lines 1-10) to remove hexitols, such as sorbitol, and maltotriol (column 8, lines 45-65). Devos et al. teaches the embodiment wherein the enriched maltitol fraction contains 94.0% maltitol, 1.0% sorbitol, and 4.9% DP3 (maltotriitol) (column 10, lines 30-40, entry for Day 14) from a solution that is 73.1%% maltitol, 3.2% sorbitol, and 14.8% maltotriitol (column 6, lines 60-65), or a removal of 68.8% of the sorbitol and 66.9% of the maltotriitol from the mother liquor. Devos et al. teaches the use highly acid cationic resins having a ratio of divinylbenzene, or degree of crosslinking, or about 4 to 10% (column 3, lines 20-50) in the chromatographic separation step performed at a temperature of about 90 °C (column 8, lines 1-5).

Devos et al. does not specifically teach subjecting said feed solution to chromatographic separation on a cation exchange resin with a degree of crosslinking of 2 to 4.5% to remove at least 75% of said mattotriose from said feed solution; collecting resulting maltose fraction containing 90-96 weight % of maltose on dry solids basis with a maltose yield of 85 weight % or higher based on the maltose content of said feed solution; and subjecting mother liquor from said crystallization to chromatographic separation on a cation exchange resin with a degree of crosslinking of 5 to 8% to remove at least 65% of sorbitol from said mother liquor to obtain a maltitol fraction containing 90-96% of maltitol with a maltitol yield of 85% or higher based on the malfitol

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content of said mother liquor (Instant claim 26). Devos et al. does not specifically teach subjecting said feed solution to chromatographic separation on a cation exchange resin with a degree of crosslinking of 5 to 8% to remove at least 65% of said glucose from said feed solution; collecting resulting maltose fraction containing 90-96 weight % of maltose on dry solids basis with a maltose yield of 85 weight % or higher based on the maltose content of said feed solution; and subjecting mother liquor from said crystallization to chromatographic separation on a cation exchange resin with a degree of crosslinking of 2 to 4.5% to remove at least 75% of maltotritol from said mother liquor to obtain a maltitol fraction containing 90-96% of maltitol with a maltitol yield of 85% or higher based on the maltitol content of said mother liquor (instant claim 27). Devos et al. does not specifically teach the resin is a gel-type resin (instant claim 29). Devos et al. does not specifically teach the temperature of 80 °C (instant claim 32). Devos et al. does not specifically teach the feed solution comprises less than 3 weight % of maltotriose (instant claim 33). Devos et al. does not specifically teach the feed solution comprises less than 1.5 weight % of maltotriose (instant claim 34). Devos et al. does not specifically teach the feed solution comprises less than 1.5 weight % of glucose (instant claim 36). Devos et al. does not specifically teach the cation exchange resin with a degree of crosslinking of 5 to 8% comprises a crosslinked acrylic resin or a sulphonated styrene divinyl benzene copolymer (instant claim 37). Devos et al. does not specifically teach the cation exchange resin with a degree of crosslinking of 2 to 4.5% comprises a crosslinked acrylic resin or a sulphonated styrene divinyl benzene copolymer (instant claim 38).

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Miyake et al. teaches the purification of maltose-containing feed starch sugar solutions by subjecting said solutions fractionation in a strongly-acidic cation exchange resin (column 1, lines 60-65). Miyake et al. teaches the purification using styrene-divinylbenzene copolymer resins bearing sulphonyl groups and commercially available such as Dowex 50WX2, Dowex 50WX4, Dowex 50WX8, and Amberlite CG-120 (column 2, lines 45-55). As evidenced by Dow, Dowex 50WX2, Dowex 50WX4 and Dowex 50WX8 are gel-type resins having a degree of crosslinking of 2, 4 and 8% respectively. Miyake et al. teaches the purification separates a high glucose fraction and a high malto-glucose, or maltotriose, fraction from the maltose fraction (column 2, lines 1-10). Miyake et al. teaches the subjecting the mother liquor from which the maltose fraction is removed to further separation methods to produce higher recovery yield of the maltose (column 2, lines 10-20).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Devos et al. in view of Miyake et al. One of ordinary skill in the art would have been motivated to combine Devos et al. in view of Miyake et al. because Devos et al. is drawn to producing a product of sufficient purity (Devos et al. column 1, lines 60-65) and teaches any maltose syrup containing more than 50% weight maltose is suitable (Devos et al. column 2, lines 5-15) and Miyake et al. is drawn to the production of a high purity maltose (Miyake et al. column 1, lines 5-15). With regard to optimization of concentrations and temperature, generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical,

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see MPEP 2144.05 II.A. See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.") One of ordinary skill in the art would be motivated to subject the mother liquor from said crystallization of maltitol to chromatographic separation to produce a maltitol fraction because Miyake et al. teaches it is well known in the art to subject the mother liquor from separation methods in order to produce higher recovery yields.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Devos et al. (US Patent 4,849,023, issued 18 Jul 1989, cited in PTO-892) in view of Miyake et al. (US Patent 4,487,198, issued 11 Dec 1984, provided by Applicant in IDS mailed 31 Jan 2005) as applied to claims 26-29 and 31-38 above, and further in view of Liaw et al. (US Patent 6,129,788, issued 10 Oct 2000, of record).

Devos et al. in view of Miyake et al. teaches as above.

Devos et al. in view of Miyake et al. does not specifically teach the feed solution is derived by saccharification of liquefied starch with pullulanase and beta-amylase, and the resulting product is derived further by treatment with maltogenic alpha-amylase, and the product formed therefrom subsequently undergoes saccharification with low temperature alpha amylase, optionally followed by a final saccharification with maltogenic alpha-amylase (instant claim 30).

Liaw et al. teaches the production of saccharide preparations involving separations (abstract). Liaw et al. teaches the production of syrups by treatment of starch during a liquifaction step with a thermostable alpha amylase and saccharification using a beta-amylase and a transglucosidase (column 2, lines 58-67). Liaw et al. teaches the transglucosidase pullulanase (column 2, lines 10-15) and alpha amylases glucoamylase and isoamylase.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Devos et al. in view of Miyake et al. and further in view of Liaw et al. All of Devos et al., Miyake et al. and Liaw et al. are drawn to the chromatographic separations of sugar preparations. Devos et al. in view of Miyake et al. teaches the feed solutions treated with enzymatic processes such as alpha-amylase and beta-amylase (Devos et al. column 6, lines 25-40). It is *prima facie* obvious to combine or substitute two processes each of which is taught by the prior art to be useful for the same purpose. An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious, see MPEP 2144.06.

Conclusion

No claim is found to be allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan S. Lau whose telephone number is 571-270-

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3531. The examiner can normally be reached on Monday - Thursday, 9 am - 4 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jonathan Lau
Patent Examiner
Art Unit 1623

/Shaojia Anna Jiang/
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